THE IMPACT OF DIVERGENT SPACE STANDARDS SYSTEMS*

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ABSTRACT

The United States has always had a decentralized system of standards. There is no government agency in which authority is centralized for the representation of U.S. interests in international organizations, or for control of the generation or maintenance of standards, This responsibility is accepted by volunteers from industry, government agencies, and other organizations, and is usually implemented through professional societies and trade organizations,

The only centralized, government supported standards activity in the U.S. has been the system of military standards (MI L. STDS.) where standards for military purposes were generated and maintained by the Department of Defense. MI L. STDS. have, of course, been used by industry and others for their own purposes, in most other countries representation in the international arena is provided by government agencies per se, or by entities authorized by the government for this purpose.

At exactly the same time that the U.S. is becoming more decentralized by the withdrawal of the Department of Defense from almost all standards activities, Western Europe is aggressively pursuing increased centralization, at least for space standards. The European Cooperation for Space Standardization (ECSS) has been recently established to develop a coherent, single set of user-friendly standards for use in all European space activities. It is significant that the ECSS has agreement anti cooperation by all the major space agencies in Europe as well as prime and sub-contracting industries across several countries, and the support, both financial and political, of the European Union.

This paper compares the divergent methods of space standardization for the U.S. ant{ Europe and evaluates the impact on future cooperative space endeavors. It proposes some concepts for avoiding problems and misunderstandings and suggests how the decentralized U.S. system could work felicitously with the ECSS.

INTRODUCTION

The United States has always had a decentralized system of standards. There is no government agency in which authority is centralized for the representation of U.S. standards interests in international organizations, or for control of the generation or maintenance of standards. This responsibility is accepted by volunteers from industry, government agencies, and other organizations, and is usually implemented through professional societies and trade organizations.

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THE AM. ERICAN NATIONAL STANDARDS INSTITUTE .(ANSI)

The American National Standards Institute (ANSI) is a private, technical not-for-profit, membership organization. Although it does not develop standards itself, it brings together and coordinates standards - developing organizations and the various interested parties such as companies, government agencies, anti other organizations both government and private. ANSI was founded in 1918 and today counts well over 1000 companies in its membership, several hundred organizations, and tens of government agencies. It is the official representative to the International Organization for Standardization (I SO) and the International Electrotechnical Commission (IEC). It is recognized as the body that accredits standards - producing organizations and it ensures that the consensus process, other procedures, due process, fairness, and openness, are followed by all standards - developing organizations. The most important functions of ANSI are to represent the U.S. to ISO and IEC, to coordinate U.S. standards policy, to be responsible for the accreditation of standards developers, and generally to ensure the integrity of the U.S. standards system. These functions are therefore carried

out by a voluntary, non-government entity, and the standards development process is decentralized and implemented by diverse volunteers from many different organizations.

U. S. GOVERNMENT STANDARDS

Within the federal government there are two separate standards activities, The first is the National Institute of Standards and Technology (NIST) which is an agency of the Department of Commerce, and the second is the Department of Defense (DOD). NIST has a focus on developing technology in general to promote the objectives of the Department of" Commerce, and specifically to develop measurement technology including fundamental measurements,

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1 his decentralized American system has worked well in the past and there is good reason to believe that it will continue to be both efficient and beneficial in the future. More and more companies are beginning to understand that standardization is a critical business issue with implications for trade, export, market access, patents and patent policy, product liability, anti-trust topics, occupational health ant{ safety, the environment, quality assurance, government acquisition, and new product development, As knowledge about standards and their use becomes more widespread in industry, one can expect participation and support for standardization to increase, and this bodes well for the voluntary, decentralized system in the U.S.

THE EUROPEAN COOPERATION FOR SPACE STANDARDIZATION

The European Cooperation for Space Standardization (ECSS) is an initiative to develop a coherent, single set of user-friendly standards for the European space community. European space business suffers from a multiplicity of standards and requirements used by different space agencies in Europe. Although these requirements are essentially similar, the impact of the differences is nonetheless serious. This leads to high costs, lower effectiveness, less competitive industry, and possible errors.

Based on a commercially oriented strategy, forces were joined to build a

comprehensive, coherent system to encompass space business activities as a whole rather then dealing only with product assurance. The European space industry was therefore fully associated with ECSS from the outset. The ECSS began in 1993 when the partners signed the ECSS terms of reference which define the framework and the basic roles of the system,

ECSS standards are being developed for space projects and applications in the following categories: project management requirements; requirements for the design, development-, manufacture, verification, and operation of space systems and their constituent parts; technical requirements for assemblies, equipment, subsystems, and systems used for s-pace missions.

I-he ECSS consists of four organizational levels; (1) a steering board that sets policy, approves standards, and generally takes responsibility for all ECSS actions; (2) a technical panel for the overall management of all processes; (3) the secretariat that deals with the traditional administrative tasks, and (4) a variety of working groups that develop draft standards, Two facts are significant here and must be noted. Although the ECSS was started by, and is led by the Centre National de' Etudes Spaciales (CNES) and the European Space Agency (ESA), other national space agencies as well as European industry support this structure and play an integral part in the development of standards, The other fact to note is that the ECSS structure is similar to both the ISO procedures and the U.S. voluntary consensus system.

CENTRALIZATION AND DECENTRALIZATION

At first glance the approach taken by Europe seems to be diametrically opposed to the increased decentralization in the U.S. On the one hand, a centralized system for space standards is being built in Europe, while, on the other hand, a centralized specification system in the U.S. is being abolished.

The U.S. and Europe have an increasing amount of cooperation in space projects, and therefore any incompatibilities in standards or standardization methods will lead to inefficiencies, higher costs, and the potential for errors. On close examination of the two systems, however, important similarities are revealed,. Indeed, the similarities are greater than the differences in spite of the fundamental differences in approach.

Both the ECSS and the decentralized U.S. system are based on voluntary consensus standards, Consensus has been defined in the ISO/I EC Guide 2 of 1991 as "General agreement, characterized by the absence of sustained opposition to substantial issues by any important part of the concerned interests, and by a process that involves seeking to take into account the views of all parties concerned and to reconcile any conflicting arguments. " Consensus need not imply

unanimity. Both the ECSS and the U.S. system use this definition of consensus. In both systems an approved standard can only be made mandatory by a contract or other legal document,

In the U.S. a performance specification states requirements in terms of the required results, and criteria for verifying compliance, but without stating the methods for achieving the required results. ECSS policy states that whenever possible each individual requirement shall bear on the need to be fulfilled, rather than on the means to fulfil that particular need.

American policy is to use the existing standards wherever possible rather than developing new ones, and in the case of military applications, civil or commercial performance specifications and standards will be used if at all possible. A special waiver is required for the use of MIL.STDS. ECSS policy states that existing standards, which satisfy the requirements should be retained, and new ones be developed on the basis of solid reasoning and experience, Furthermore, standards shall be structured in a way that facilitates essential tailoring for application to specific projects. The latter is also common practice in the U.S.

ECSS standards are based on, and developed from, ISO 9000 standards. In the U.S. ISO 9000 is rapidly becoming the norm.

CONCLUSIONS

From the above it may be seen that there are many similarities between ECSS policy and the manner in which the decentralized American standards system works, The similarities extend to objectives and methods of working. On the surface however, the two systems are very different, and this can lead to misunderstandings and its consequences, The authors therefore propose that officials or experts from the ECSS and from the U.S. initiate and implement a continuing dialogue through periodic meetings to coordinate progress, avoid overlap, and to agree on which standards should be transferred to ISO for promulgation as ISO international standards.

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